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EXAMINER	
HOFFBERG, ROBERT JOSEPH	

ART UNIT	PAPER NUMBER
2835	

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/748,309	WEI, WEN	
	Examiner	Art Unit	
	Robert J. Hoffberg	2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10,12-15,17-24 and 26-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,3-10,12-15,17-24 and 26-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Claim Objections

1. Claims 7 and 17 objected to because of the following informalities: Claim 7 depends on canceled claim 2. For examination purposes, claim 7 will depend on claim 1. Claim 17 depends on canceled claim 16. For examination purposes, claim 17 will depend on claim 15. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 6, 8-10, 12-15, 17, 20, 22-30 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Lin et al. (US 6,752,587).

With respect to Claim 1, Perazzo teaches a modular platform cooling apparatus, comprising: at least one plenum (Fig. 7, #42) associated with the apparatus; and a first and a second fan module (Fig. 7, #10 left and right side) configured to removably (Col. 2, line 44) and independently (Col. 2, line 53) engage the plenum and each being designed to direct an airflow through a bottom (Fig. 7, #20) of the first and second fan modules and out a respective rear portion (Fig. 6, #24, side) of the first and second fan modules. Perazzo fails to teach a fan module with a plurality of fans arranged in a

matrix array of 2xN fans. Lin et al. teaches a fan module (Fig. 4, #10) with a plurality of fans (Fig. 4, #12 and #14) arranged in a matrix array of 2xN fans (see Fig. 4) positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo with that of Lin et al. for the purpose of having fans arranged in both a serial and parallel configuration to have maximum draft for cooling the modular platform (Col. 3, lines 41-43).

With respect to Claims 3 and 17, Perazzo teaches the modular platform cooling apparatus or the modular platform of the above claims. Perazzo fails to teach the fans are arranged 2-across by 2-deep in-plane relationship. Lin et al. further teaches that at least one of the first and second fan modules includes a matrix array of four fans wherein N=2. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo with that of Lin et al. for the purpose of having fans arranged in both a serial and parallel configuration to have maximum draft for cooling the modular platform (Col. 3, lines 41-43).

With respect to Claim 6 and 20, Perazzo further teaches that at least one of the first and second fan modules may be removed from at least one plenum while the other fan module continues to provide airflow (Col. 2, line 53) through a modular platform (Col. 1, lines 17-20).

With respect to Claims 8 and 22, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to disclose the specific airflow capacity, Perazzo discloses an airflow that is produced by a given fan model (Col. 6, line 18). It would have been obvious to one of ordinary skill in the art at the time of the invention was made that the number of fans selected to be incorporated into a fan module is proportionate (the first fan module would be selected to provide sufficient airflow capacity to cool (y/x)m modular platform boards at a specified capacity, where y equals the total number of side-by-side fans in the first fan module and x equals the total number of fans positioned side by side across an aggregate width of the modular platform, and m equals the total number of modular platform boards) to fan module's width compared to the total width of modular platform.

With respect to Claims 9 and 23, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to disclose the specific remaining airflow when a fan module is removed, Perazzo discloses an airflow through each fan housing (Col. 5, line 58). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a capacity greater than 50% or any percentage that the first fan module will continue to provide airflow through the modular platform to support the modular platform boards and a capacity greater than 50% when the second fan module has been removed from the plenum, which would allow the device to operate at maximum efficiency.

With respect to Claims 10 and 24, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to disclose the specific airflow, Perazzo does disclose that the fan modules are capable of providing sufficient airflow, when operating in conjunction with each other (Col. 6, lines 14+). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a combined cooling capacity of 2 m (where m equals the total number of modular platform boards) or any other capacity to insure that a single fan module alone has the capacity to cool the m modular platform boards.

With respect to Claims 12 and 26 Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to disclose the specific width of the plenum and fan modules, Perazzo does disclose that the plenum is the width of the apparatus and the combined width fan modules are the width of the apparatus in Fig. 7. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the width of the plenum and the combined width of the fan modules to be less than or equal to 440 mm or any other width to cool the modular platform cooling apparatus.

With respect to Claims 13 and 27, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to disclose the temperature rise or maximum power consumption of the platform, Perazzo does disclose that the electronics must be cooled to prevent overheating (Col. 1, line 48). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a less than or equal to 10-degrees

Celsius temperature increase per modular platform board, where each modular platform board can generate up to 200 Watts, or any other maximum temperature increase which permits the electronics to operate properly.

With respect to Claims 14 and 28, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to disclose the number of boards, Perazzo does teach a platform for platform boards (Col. 1, line 26-27). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have up to sixteen modular platform boards or any number boards and the first fan module and the second fan module or any number of fan modules to provide enough airflow to keep the temperature increase across any modular platform board to less than or equal to 10 degrees Celsius or any temperature increase which permits the electronics to operate properly.

With respect to Claim 15, Perazzo teaches a modular platform, comprising: a plurality of modular platform boards (Col. 1, line 27); at least one plenum (Fig. 7, #42) coupled to the modular platform (Fig. 7, #40); and a first and a second fan module (Fig. 7, #10 left and right side) configured to removably (Col. 2, line 44) and independently (Col. 2, line 53) engage the plenum, and each being designed to direct an airflow through a bottom (Fig. 7, #20) of the first and second fan modules and out a respective rear portion (Fig. 6, #24, side) of the first and second fan modules. Perazzo fails to teach a fan module with a plurality of fans arranged in a matrix array of 2xN fans. Lin et al. teaches a fan module (Fig. 4, #10) with a plurality of fans (Fig. 4, #12 and #14) arranged in a matrix array of 2xN fans (see Fig. 4) positioned in a N-across by N-deep

in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo with that of Lin et al. for the purpose of having fans arranged in both a serial and parallel configuration to have maximum draft for cooling the modular platform (Col. 3, lines 41-43).

With respect to Claim 29, Perazzo further teaches wherein the modular platform includes an intake plenum (Fig. 7, #44) and an exhaust (Fig. 7, #42) plenum.

With respect to Claim 30, Perazzo further teaches wherein the first and second fan modules are positioned in the exhaust plenum (see Fig. 7).

With respect to Claims 33 and 34, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. While they fail to teach that the fan modules may include a different number of fans, Perazzo does teach that the fan modules may operate with a different number of fans operating (Col. 6, lines 25-32). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a first fan module that has a first number of fans and the second fan module that has second number of fans, the first number is different from the second number or as many fans in each module as is necessary for the apparatus or platform to properly operate under the normal or expected fault operating conditions.

4. Claims 4 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Lin et al. (US 6,752,587) as applied to the above claims, and further in view of Yoshikawa (US 6,222,729).

With respect to Claims 4 and 18, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. They do not teach that the six-fan matrix arrangement in the fan module. Yoshikawa teaches that a fan module can be arranged in a 3-across by 2-deep (Col. 3, lines 29-32) in-plane relationship. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo in view of Lin et al. with that of Yoshikawa for the purpose of arranging the fans based on space restraints, air flow and reliability requirements.

5. Claims 5 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Lin et al. (US 6,752,587) as applied to the above claims, and further in view of Dent (US 6,537,019).

With respect to Claims 5 and 19, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. They do not teach the requirements for selection and placement of the two fans. Dent teaches that the fans have a center hub of a certain diameter and the fans positioned in the 2-deep relationship are separated by a distance that is proportional to and a function of the diameter of the hub (Col. 3, lines 14-26). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the modular platform cooling

apparatus or modular platform of Perazzo in view of Lin et al. with that of Dent to arrange the fans in parallel to maximize air flow.

6. Claims 7 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Lin et al. (US 6,752,587) as applied to the above claim, and further in view of Houdek (US 6,406,257).

With respect to Claims 7 and 21, Perazzo in view of Lin et al. teach the modular platform cooling apparatus or the modular platform of the above claims. They do not teach the circuitry designed to allow for hot-swapping the second fan module while the apparatus is in operation. Houdek teaches the circuitry (Fig. 3, #111) designed to allow the second fan module to be removably (Col. 3, line 18 hot swap) added to the apparatus while the apparatus, including the first fan module, is in operation. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo in view of Lin et al. with that of Houdek to add circuitry to remove a fan module during apparatus operation to minimize down time of the apparatus.

7. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Lin et al. (US 6,752,587) as applied to the above claims, in view of Negishi (US 6,421,238).

With respect to Claim 31, Perazzo in view of Lin et al. teach the modular platform of claim 15. They do not teach the dual plenum fan modules. Negishi teaches that the first (Fig. 7, #24 on left side) and second (Fig. 7, #24 on right side) fan modules are configured as dual plenum (Fig. 8, #28) fan modules, having a first portion acting as an

intake (upper surface of Fig. 8, #28) for an adjacent modular platform and a second portion acting as an exhaust (lower surface of Fig. 8, #28) for the modular platform. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform of Perazzo in view of Lin et al. with that of Negishi to position the plenum wall to create two separate airflow paths to save space, parts and costs.

With respect to Claim 32, Perazzo in view of Lin et al. and further in view of Negishi teach the modular platform of the above claims. They do not teach the height of the fan modules. While they fail to disclose a specific fan module height, an appropriate fan is chosen to fit the space constraints (see Negishi, Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform for the height of the first and second fan modules to be less than or equal to 2 U or any other height in order to fit into the space provided for ventilation.

Response to Arguments

8. Applicant's arguments, filed 4/14/06, with respect to the rejection(s) of claim(s) have been fully considered and are persuasive for amended claims 1 and 15 and claims dependent thereon. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made above.

9. Regarding applicant's arguments for Perazzo (US 6,813,152). Perazzo teaches a plurality of fan modules configured to removably and independently engage the plenum and each being designed to direct an airflow through a bottom of the each fan

modules and out a respective rear portion each fan modules. Perazzo further teaches a "fault tolerant airflow system" allowing the system to continue to provide an airflow upon a fan failures at Col. 2, lines 60-64. Applicant's argument regarding fans substantially behind another fan fails because Perazzo clearly teaches in Fig. 3 that #14 in front of #16, which both are in front of #18. The airflow offset during operation has no bearing on the physical placement of the fans as claimed. In fact Perazzo teaches combining the advantage of both serial and parallel fan system, a serial arrangement of fans as shown in Fig. 3, can be arranged for the fans to draw air in a parallel (Col. 3, lines 27-29).

10. Regarding applicant's arguments for Lin et al. (US 6,752,587). Lin et al. teaches in Figure 4, a fan module (#10 and Col. 3, lines 23-25) comprising a plurality of fans (#12 left & right and #14 left & right) arranged in a matrix array of 2xN fans positioned in a N-across (#12 left & right) by N-deep (#12 and #14) in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans (#14 left is behind #12 left and #14 right is behind #12 right), where N is an integer equal to or greater than 2. At Col. 3, lines 23-25, Lin et al. teaches that the modular fan assembly 10 in Fig. 4 "is substantially comprised of two coupled fan assemblies 10 of the first embodiment" (Fig. 2). The examiner is referring to the modular fan assembly 10 in Figure 4 and <u>not</u> the modular fan assembly 10 in Figure 2. The second embodiment as taught by Figure 4 is clearly a plurality of fans arranged in a matrix array of 2xN fans positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2.

11. As shown above, the reference used in the previous office actions (Edmunds) and reference given informally (Lin) to assist applicant in amending their claims clearly show serial fans in a fan module. Furthermore, recently issued patent Rubenstein et al. (US 7,021,895) is prior art that is not relied upon also teaches in Fig. 1, a plurality of fans arranged in a matrix array of 2xN fans positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2.

12. Perazzo in view of Edmunds, Perazzo in view of Lin et al. or Perazzo in view of Rubenstein anticipate the applicant's first and second modules each including a plurality of fans arranged in a matrix array of 2xN fans positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2.

13. Claim 6 is the same as originally presented and should be described as currently amended.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rubenstein et al. (US 7,021,895) teaches a fan module with a plurality of fans (Fig. 4, #12 and #14) arranged in a matrix array of 2xN fans (see Fig. 4) positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2. Edmunds et al. (US 6,407,918) in Figures 1 and 3 teaches a fan module with a plurality of fans arranged in a matrix array of 2xN fans positioned in a N-across by N-

deep in-plane relationship wherein N fans are positioned substantially behind N other of the 2xN fans, where N is an integer equal to or greater than 2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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